

California Regional Water Quality Control Board  
North Coast Region

ORDER NO. R1-2008-0025

WDID NO. 1B86002RSON

NOTIFICATION, MONITORING, AND REPORTING PROGRAM

FOR

GEYSERS POWER COMPANY, LLC

CALPINE CORPORATION

AT

THE GEYSERS

Sonoma County

INTRODUCTION

This Notification, Monitoring, and Reporting Program (NMRP) is issued pursuant to California Water Code (CWC) section 13267(b) and requires notification prior to any construction activities associated with road construction, drill site preparation, well drilling, well re-working, well abandonment, or modification to the wastewater injection distribution system, as well as notification due to circulation loss, monitoring and reporting of injection fluids and spills, and submittal of technical reports to assess and demonstrate compliance with Waste Discharge Requirements (WDR) Order Number R1-2008-0025. Reports are required on a monthly and an annual basis and within two weeks of a spill event, for:

- 1) tracking fluid injection volumes,
- 2) tracking the injection of spent geothermal fluids, an insignificant amount of power plant black water (septic tank supernatant); treated wastewater from Lake and Sonoma Counties, surface water, and storm water runoff (injectate) quality, and
- 3) characterizing a spill event and providing future preventative spill mitigation(s) efforts. The WDR explains the need for this information and the authority for requiring these reports.

OBJECTIVES

The objectives of notification, monitoring, and reporting conducted under this monitoring program are to:

- Evaluate field construction activities and proposed methods to treat controllable sediment delivery.
- Assess and demonstrate compliance with Order No. R1-2008-0025.
- Provide the Discharger and the Regional Water Board with the necessary information and an opportunity to evaluate spill events, and to require implementation measures to prevent future spills.

Under the authority of CWC section 13267(b), the Discharger named above is required to comply with the following:

## **NOTIFICATION**

### **A. PRIOR TO CONSTRUCTION**

The Discharger shall submit a notice in writing to the Regional Water Board at least fourteen days (14) prior to any construction activities associated with road construction, drill site preparation, well drilling, well re-working, well abandonment, or modification to the wastewater injection distribution system. The notice shall include:

1. Proposed construction dates,
2. Location(s) of the activities,
3. Description of the activities,
4. Method(s) of construction, and
5. Proposed location of ultimate disposal of excess or waste earthen materials and drill cuttings.

### **B. CIRCULATION LOSS**

The Discharger shall immediately notify the Regional Water Board of any circulation loss during the construction of a well at depths less than 300 feet. The notice shall include:

1. Location of the well,
2. Well depth at the circulation loss,
3. Amount of drilling mud lost, and
4. Method of correction.

### **C. ACCIDENTAL SPILL NOTIFICATION**

For spills of liquid waste and hazardous wastes, refer to Section K, Accidental Spill Notification and Reporting.

### **D. USE OF INJECTATE FOR FIRE FIGHTING AND SOIL COMPACTION**

Injectate consists of a combination of spent geothermal fluids, an insignificant amount of power plant black water (septic tank supernatant); treated wastewater from Lake and Sonoma Counties, surface water, and storm water runoff. The Discharger shall submit a written report to the Regional Water Board within fourteen days (14) after injectate is used for fire fighting or soil compaction. The notice shall include:

1. Use of the injectate,
2. Date(s) the injectate was used,
3. Location(s) of the activity(s),
4. Volume of injectate used,
5. Known or estimated composition of the injectate,
6. Volume which entered or which may enter receiving waters, and
7. Measures taken or proposed to be taken to prevent or control discharge of pollutants to receiving waters associated with this use of injectate.

**MONITORING**

**Injection Fluids**

**E. COOLING TOWER BASIN CONDENSATE**

The Discharger shall collect samples of cooling tower water annually during July from each cooling tower basin at Units 1, 3, 5&6, 7&8, 9&10, 11, 12, 14, 17, 18, and 20. The Discharger will then have these samples analyzed for the following constituents:

<u>Constituents</u> <u>Frequency</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling</u>
pH (field)	pH units	grab	annual
Specific Conductivity	µmhos/cm	grab	annual
Ammonia	mg/L	grab	annual
Chlorides	mg/L	grab	annual
Nitrate	mg/L	grab	annual
Nitrite	mg/L	grab	annual
Antimony	ug/L	grab	annual
Arsenic	ug/L	grab	annual
Beryllium	ug/L	grab	annual
Boron	mg/L	grab	annual
Cadmium	ug/L	grab	annual
Cobalt	ug/L	grab	annual
Copper	ug/L	grab	annual
Chromium	ug/L	grab	annual
Iron	ug/L	grab	annual
Lead	ug/L	grab	annual
Mercury	ug/L	grab	annual
Molybdenum	ug/L	grab	annual
Nickel	ug/L	grab	annual
Selenium	ug/L	grab	annual
Silver	ug/L	grab	annual
Thallium	ug/L	grab	annual
Vanadium	ug/L	grab	annual

**F. TERMINATION RESERVOIR EFFLUENT DISCHARGE**

The Discharger shall collect samples of the Termination Reservoir effluent discharge (or data from the City of Santa Rosa) annually during July. The Discharger will then have these samples analyzed for the following constituents:

<u>Constituents</u> <u>Frequency</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling</u>
pH (field)	pH units	grab	annual
Specific Conductivity	µmhos/cm	grab	annual
Ammonia	mg/L	grab	annual
Chlorides	mg/L	grab	annual
Nitrate	mg/L	grab	annual
Nitrite	mg/L	grab	annual
Residual chlorine	mg/L	grab	annual
Antimony	ug/L	grab	annual

Arsenic	ug/L	grab	annual
Beryllium	ug/L	grab	annual
Boron	mg/L	grab	annual
Cadmium	ug/L	grab	annual
Cobalt	ug/L	grab	annual
Copper	ug/L	grab	annual
Chromium	ug/L	grab	annual
Iron	ug/L	grab	annual
Lead	ug/L	grab	annual
Mercury	ug/L	grab	annual
Molybdenum	ug/L	grab	annual
Nickel	ug/L	grab	annual
Selenium	ug/L	grab	annual
Silver	ug/L	grab	annual
Thallium	ug/L	grab	annual
Vanadium	ug/L	grab	annual

**G. LAKE COUNTY SANITATION DISTRICT PIPELINE EFFLUENT**

The Discharger shall collect samples of the Lake County Sanitation District Pipeline effluent discharge (or data from the Lake County Sanitation District) annually during July. The Discharger will then have these samples analyzed for the following constituents:

<u>Constituents</u> <u>Frequency</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling</u>
pH (field)	pH units	grab	annual
Specific Conductivity	µmhos/cm	grab	annual
Ammonia	mg/L	grab	annual
Chlorides	mg/L	grab	annual
Nitrate	mg/L	grab	annual
Nitrite	mg/L	grab	annual
Residual chlorine	mg/L	grab	annual
Antimony	ug/L	grab	annual
Arsenic	ug/L	grab	annual
Beryllium	ug/L	grab	annual
Boron	mg/L	grab	annual
Cadmium	ug/L	grab	annual
Cobalt	ug/L	grab	annual
Copper	ug/L	grab	annual
Chromium	ug/L	grab	annual
Iron	ug/L	grab	annual
Lead	ug/L	grab	annual
Mercury	ug/L	grab	annual
Molybdenum	ug/L	grab	annual
Nickel	ug/L	grab	annual
Selenium	ug/L	grab	annual
Silver	ug/L	grab	annual
Thallium	ug/L	grab	annual
Vanadium	ug/L	grab	annual

## H. INJECTION FLUIDS VOLUME MONITORING

The Discharger shall record the number of gallons of geothermal steam condensate, Termination Reservoir effluent discharge (City of Santa Rosa's treated effluent), and Lake County Sanitation District's pipeline effluent discharge and the total fluid volume that is discharged into the geothermal reservoir. The Discharger shall also record the number of injectate gallons discharged to each injection well per month.

## I. ACCIDENTAL SPILL MONITORING

In the event of an accidental spill of any liquid waste to surface waters, the Discharger shall implement the following monitoring program:

<u>Constituents</u>	<u>Sampling Location</u>	<u>Units</u>	<u>Type of Sample</u>
pH (field)	001, 002, 003	pH units	grab
Specific Conductivity	001, 002, 003	µmhos/cm	grab
Temperature	001, 002, 003	C°	grab
Ammonia	001, 002, 003	mg/L	grab
Chlorides	001, 002, 003	mg/L	grab
Nitrate	001, 002, 003	mg/L	grab
Nitrite	001, 002, 003	mg/L	grab
Antimony	001, 002, 003	ug/L	grab
Arsenic	001, 002, 003	ug/L	grab
Beryllium	001, 002, 003	ug/L	grab
Boron	001, 002, 003	mg/L	grab
Cadmium	001, 002, 003	ug/L	grab
Cobalt	001, 002, 003	ug/L	grab
Copper	001, 002, 003	ug/L	grab
Chromium	001, 002, 003	ug/L	grab
Iron	001, 002, 003	ug/L	grab
Lead	001, 002, 003	ug/L	grab
Mercury	001, 002, 003	ug/L	grab
Molybdenum	001, 002, 003	ug/L	grab
Nickel	001, 002, 003	ug/L	grab
Selenium	001, 002, 003	ug/L	grab
Silver	001, 002, 003	ug/L	grab
Thallium	001, 002, 003	ug/L	grab
Vanadium	001, 002, 003	ug/L	grab
Turbidity	001, 002, 003	NTU	grab
Settleable Matter	001, 002, 003	mg/L	grab
Fish Bioassay*	001, 002, 003	96-hour percent survival	grab

\* Rainbow Trout, *Oncorhynchus mykiss*, shall be used as the test fish and the test temperature shall be maintained between 14° and 17°C.

Sampling Location 001 shall be at the source of the spill and shall be representative of the material spilled. It shall be sampled once as soon after the spill as possible.

Sampling Location 002 shall be in the affected stream at a point upstream from the area influenced by the spill and shall be sampled once as soon after the spill as possible.

Sampling Location 003 shall be in the affected stream within the zone influenced by the spill and shall be relocated as that influenced zone proceeds downstream. It shall be sampled once each six hours beginning as soon after the spill as possible and continuing for as long as the spill can be traced, but not to exceed four samples unless directed to continue sampling by the Regional Water Board's Executive Officer.

## **REPORTING**

### **J. Monthly Reporting**

The Discharger shall submit monthly reports to the Regional Water Board with the following monitoring results and reports related to field operations in The Geysers . These reports will be submitted the first day of the second calendar month following the month of sampling:

1. Gallons of geothermal steam condensate, Termination Reservoir effluent discharge, Lake County Sanitation District's pipeline effluent discharge, and the total fluid volume discharged into the geothermal reservoir.
2. Injectate gallons discharged to each injection well.
3. Summary of spill events and measures taken to prevent future spill events.
4. Discussion of pertinent field activities, problems related to water quality, and mitigations.

### **K. Annual Reporting**

The Discharger shall submit the following monitoring results to the Regional Water Board between September 15 and 30 each year:

1. Steam condensate sampling results from Units 1, 3, 5&6, 7&8, 9&10, 11, 12, 14, 17, 18, and 20.
2. Sampling results from the Termination Reservoir effluent discharge or data obtained from the City of Santa Rosa.
3. Sampling results from the Lake County Sanitation District Pipeline effluent discharge or data obtained from Lake County Sanitation District.

### **L. Accidental Spill Notification and Reporting**

The Discharger shall immediately notify the Regional Water Board of a spill of any liquid waste as soon as practical but no later than 12 hours after the initial spill discovery.

### **Reporting Thresholds:**

Reportable discharge volumes of recycled wastewater are as follows:

1. Disinfected tertiary treated wastewater – volumes greater than 50,000 gallons of (section 13529.2 Unauthorized discharges, Porter-Cologne Water Quality Control Act),
2. Disinfected secondary-23 treated wastewater – volumes greater than 1,000 gallons of (section 13529.2 Unauthorized discharges, Porter-Cologne),
3. Geothermal steam condensate in volumes greater than 100 gallons, and

4. Any mixture of the above would be reported on the more/most strict volume.

All unauthorized discharges shall be reported by telephone within 12 hours, and followed up within two weeks by a written report describing the incident, regardless of volume, if any one of the following occurs:

1. Discharge enters into any water of the State,
2. Discharge enters into a conveyance (ditch or culvert) directly discharging to a Class I watercourse (perennially flowing stream or stream containing fish, or a watercourse containing a developed domestic water source),
3. The discharge creates any erosion or deposition of sediment that could enter into a watercourse,
4. The discharge results in additional infrastructure damage or failures or potential infrastructure damage or failures,

#### **M. Report Format**

The monitoring reports shall be arranged in tabular form so that the date, location, constituents, and the concentrations are easy to read and interpret.

The Discharger shall report to the Regional Water Board the results of any additional monitoring performed in addition to that required by Notification, Monitoring and Reporting Program Order No. R1-2008-0025.

#### **N. FAILURE TO COMPLY WITH THE TERMS OF THIS ORDER**

Failure to comply with the terms of this Order can result in civil liabilities of up to \$5,000 per day under CWC section 13268(a)(b)&(d)(1), or misdemeanor prosecution under CWC section 13268(c)&(d)(2).

#### **O. ABILITY TO PETITION THIS ACTION OF THE BOARD**

Any person affected by this action of the Board may petition the State Water Resources Control Board (State Water Board) to review the action in accordance with section 13320 of the CWC and Title 23, California Code of Regulations, section 2050. The petition must be received by the State Water Board within 30 days of the date of this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request. In addition to filing a petition with the State Water Board, any person affected by this Order may request the Regional Water Board to reconsider this Order. Such request must be made within 30 days of the date of this Order. If reconsideration by the Regional Water Board is sought, filing a petition with the State Water Board within the 30-day period is necessary to preserve the petitioner's legal rights. If you choose to appeal this Order, be advised that you must comply with this Order during the appeal process.

Ordered by: \_\_\_\_\_  
Catherine Kuhlman  
Executive Officer

July 24, 2008